

Welcome to the Division of Disease Prevention's Hepatitis B Virus (HBV) Frequently Asked Questions

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The hepatitis B virus, magnified by electron microscope

What is HBV?

Hepatitis B is inflammation of the liver caused by infection with the hepatitis B virus (HBV). Viruses are extremely small particles that cannot be seen by the naked eye. The hepatitis B virus belongs to the viral family known as *Hepadnaviridae*. It was isolated in the laboratory for the first time in 1965 by Dr. Baruch Blumberg. Dr. Blumberg won the Nobel Prize for his discovery and for the invention of the hepatitis B vaccine which became available in 1982.



There is a chronic (lifelong) state of hepatitis B viral infection. This chronic state of hepatitis B kills 5,000 Americans each year.

Who becomes infected with HBV?

Anyone who is not immune to HBV can become infected after exposure to the virus. People who are already immune--either from previous infection or because they have been vaccinated against HBV--will not become infected.

- In the United States 1.25 million people are lifelong (chronic) carriers of the hepatitis B virus. They are therefore infectious to others.
- In 2003 there were 73,000 new HBV infections reported to the Centers for Disease Control and Prevention.
- More than two billion (one third the world's population) are immune to HBV because of past or present infection.
- Over 350 million people worldwide are chronic carriers of HBV.



Only 3-5% of adults in the United States are immune to HBV because of previous exposure to HBV or vaccination against HBV. But because of aggressive vaccination programs, 90% of those 2 and under are immune from HBV.



Hepatitis B continues to be one of the most frequently reported vaccine-preventable diseases in the United States.

How do people become infected with HBV?

HBV is transmitted very differently from the hepatitis A virus (HAV), which you may have read about. HBV is not found in the stool, but in body fluids like blood and semen. Not all body fluids of HBV-infected individuals have the same concentration of the virus. For instance, blood possesses much greater amounts of HBV than does saliva or tears. In general, the main ways of becoming infected with HBV are:

- Contact with sexual fluids, such as semen and vaginal secretions, containing the hepatitis B virus;
- Contact with human blood containing the hepatitis B virus;
- Perinatally (from mother to baby during delivery)

Other body fluids, such as saliva and tears, are very rarely a source of infection. Hepatitis B virus is not spread by contaminated food or water, and cannot be spread casually in the workplace



Globally, most HBV infections occur from infected mother to child, from child to child contact in household settings, and from reuse of unsterilized needles and syringes. In some developing countries, almost everyone has been HBV infected by the time they are adults.

What groups of people are more at risk to become infected with HBV?

The reason these groups below are higher-risk groups for the transmission of HBV is that they are more likely to have direct contact with HBV-infected body fluids.

Injection drug users

The most efficient way to become infected with HBV is to shoot drugs with a needle previously used by someone with HBV, because there is direct transmission of the

hepatitis B viral particles into the bloodstream. For instance, 40% of injection drug users become infected with hepatitis B after only 1 year of drug use, and 80% of injection users become infected after 10 years of use.

Persons with multiple sex partners or diagnosis of a sexually transmitted disease

People who have sex with multiple sex partners generally do so with those who *also* have multiple sex partners. Therefore, there is a greater chance that one or both of those people will have a sexually transmitted infection (STI). Many STIs such as herpes, when in the active state, result in open sores around the genitals. These sores can be very small or even invisible, but still allow for HBV-infected sexual fluids to more easily enter the body, if one of the sex partners has HBV. Additionally, people with multiple sex partners tend to partake in riskier—and sometimes unhealthy—behaviors which may put them at risk for coming into contact with someone else's blood or body fluids.

Men who have sex with men (MSM)

MSM are at greater risk for HBV infection because they may be more likely to have anal sex. This type of sex can cause small tears or rips around the lining of the anus. This could allow for HBV-infected semen to more easily enter the body.

Sex contacts of HBV-infected persons

Since all kinds of sex can result in an exchange of body fluids which may be HBV infected, anyone who has sex with someone who is an HBV carrier--whether short-term or chronically--can become HBV infected.

Health care workers

Health care workers will likely come into contact with body fluids. Occasionally they experience needle stick injuries (an accidental needle puncture of the skin during patient care). If the needle has not been used yet, a needle stick injury poses little threat. However, if the needle was just used to draw the blood of someone with HBV then there is a 30% chance of infection if that healthcare worker is not already immune to HBV.

Patients who have kidney problems and undergo routine dialysis

The kidneys filter our blood of many impurities. When they are unable to do so, undergoing blood dialysis on a regular basis is necessary to clear out impurities. This process involves circulating a patient's blood through a complex system of filters. Occasionally, an HBV-infected patient's blood is not thoroughly removed from the dialysis machine. Other patients whose blood circulates through the HBV-infected dialysis machine can then pick up the hepatitis B viral particles and become infected.

Household contacts of chronically infected persons

Unfortunately, living in close quarters for a long time with someone who is HBV-positive puts those around him or her at risk. Over the years, small/unrecognized exchanges of blood or other body fluids may occur from the HBV-positive person to HBV-negative persons. In addition, the hepatitis B virus can live on environmental surfaces for up to seven days. While the chances of infection from those surfaces are small, it is possible.

Infants born to infected mothers

During the delivery process, exchanges of blood can occur from mother to child. Even a small transfer of blood can start an infection. At least 10 % of babies born to HBV-infected mothers will become HBV-infected without post-exposure prophylaxis. The number one predictor of mother-child HBV transmission is the mother's viral load at the time of delivery. If the 'e' antigen is present in the mother, the viral load is usually very high.

Infants/children of immigrants from areas with high rates of HBV infection

The younger the age that infection occurs, the more likely the HBV infection will become chronic. Because prevention, testing and treatment for HBV in some parts of the world have not been a significant part of public health, many people have acquired HBV, most at a very early age. Therefore, there are many chronic carriers of HBV in other parts of the world.



Those regions of the world which have the highest rates of hepatitis B include China, most of Africa, and southeast Asia.

What are the signs and symptoms of someone ill with HBV?

About half of those adults acutely infected with HBV have no signs or symptoms. However, the other half does have signs and symptoms.

Signs are clues to a patient's condition which can be observed by a nurse or doctor, and they include:

- Vomiting
- Dark urine
- Clay-colored stools
- Sudden weight loss
- Jaundice (pronounced as 'jawn-dis', this is where the eyes and skin turn yellow).

Symptoms are clues to a patient's condition which the patient *feels*, but which cannot be observed by a nurse or a doctor, and they include:

- Decreased appetite
- Nausea
- Fatigue
- Pain in the upper-right belly
- Fever.

Three things to remember about the signs and symptoms of hepatitis B:

- They appear in susceptible people within 6 weeks to 6 months of infection;
- Only around 50% of adults will have symptoms during the initial infection. The rest will have no signs or symptoms at all;
- Infants and children have fewer signs and symptoms than adults do.



If you are reading this web page and think you might have Hepatitis B right now, consult your primary healthcare provider for diagnosis and treatment options.

How long do the signs and symptoms last?

It can take from 6 weeks to 6 months for a newly infected person to show signs and symptoms. In most cases people recover from the HBV illness within 2-8 weeks. Some people, however, may feel weak and fatigued for months after the other signs and symptoms disappear.



Many *chronic carriers* of HBV have no signs or symptoms for 10-20 years as they advance into serious HBV liver disease without knowing it.

What tests are performed to determine if I have hepatitis B?

A blood sample is all that is needed in order to perform the necessary tests for HBV.

- HBc-IgM Ab (hepatitis B core IgM antibody)

Looks for acute HBV antibodies circulating in your blood. **Antibodies are protein markers in the blood which tell you that at some point in the past your blood came into contact with HBV.** It can take up to twelve weeks for the HBV IgM antibodies to become detectable, and this time is called the window period. Before the antibodies are detectable, the IgM test will be “negative.” After the antibodies are detectable, the IgM

test will be “positive,” indicating acute infection, and at this point you are able to pass the infection to others.

- HBc Ab (hepatitis B core antibody)

Looks for core HBV antibodies circulating in your blood. These antibodies indicate if you have ever had HBV. It can take up to twelve weeks for the core HBV antibodies to become detectable after being infected.

- HBsAb (hepatitis B surface antibody)

Looks for surface HBV antibodies circulating in your blood. These antibodies indicate if you were ever vaccinated against HBV. It can take nine months for the surface antibodies to become detectable after being infected.

- HBsAg (hepatitis B surface antigen)

Looks for HBV surface antigen which is a marker for the virus. If HBsAg is positive, then active infection is present. Active infection means that the hepatitis B virus is circulating in your body, and you are able to pass this virus to others. If the HBsAg is still positive more than six months after acute infection, the person is probably going to be a chronic carrier of HBV.



Among adults, only 6% of those who are infected with HBV become chronic carriers. The other 94% resolve the infection completely, and can never again become ill from re-infection.

What is the treatment for HBV?

Most people require simple bed rest and fluids and food as tolerated in order to recover. A small percentage of acutely infected HBV patients require a short stay in the hospital to treat dehydration and general malaise or fatigue. For the 6% of HBV-infected adults who do not recover and become chronic carriers of the hepatitis B virus, there are currently four treatments available in the United States.



For more information please see the ‘Treatment Referral Guide for Virginians with Chronic Hepatitis B and Hepatitis C’ link on our main Viral Hepatitis page.

How many times can I get HBV?

You can become ill with acute hepatitis B only ONCE in your lifetime unless you become a chronic carrier of the virus. After you are infected for the first time—whether you become ill or not--your body makes hepatitis B antibodies. These antibodies circulate in your blood for the rest of your life and will fight off the hepatitis B virus if you are ever again infected.



If you are ever infected with HBV and resolve the infection, you do not need the three-shot vaccination series to prevent HBV. The HBV antibodies left behind from previous infection will protect you from becoming re-infected.

Can the hepatitis B virus stay in the body permanently?

Yes. There is a lifelong--or chronic--state of Hepatitis B. This occurs in:

- 90% of infants infected during the first year of life;
- 30% to 50% of children infected between 1 to 5 years of age;
- 6% of people infected who are 6 years of age or older



Therefore, the younger a person is when he or she is infected with HBV, the *more likely* that person is to become a chronic carrier of HBV.

Is HBV deadly?

As we mentioned at the beginning of this web page, in the United States HBV is responsible for the deaths of around 5,000 people per year. The risk of death from HBV-related liver cancer or cirrhosis is approximately 15-25% for persons who become long-term carriers during childhood. By comparison, the yearly number of deaths from HIV is around 15,000; the number of yearly deaths from Hepatitis C is between 10,000 and 12,000.

To minimize the risk of serious illness and death from chronic HBV, and infected person should:

- Abstain from alcohol use.
- Be careful about taking hepatotoxic drugs such as acetaminophen (Tylenol) or cholesterol-lowering drugs that may worsen liver damage.

- Not donate blood, body organs, other tissue, or semen.
- Not share any personal items that may have blood on them (e.g., toothbrushes and razors).
- Discuss the risk for transmission with your partner and discuss the need for counseling and testing.



If you are a chronic carrier of HBV, you should absolutely be tested for the hepatitis A virus (HAV) and the hepatitis C virus (HCV). You should be vaccinated against HAV if you have never been exposed to HAV. It is very important to avoid becoming ill with two or more types of viral hepatitis. There is no vaccine against HCV.

What are the best ways to prevent becoming infected with HBV?



The best way to avoid infection from HBV is to complete the three-shot vaccination series against HBV (see HAV and HBV Vaccine Fact Sheet Link).

- If you are having sex, but not with one steady partner, use latex condoms correctly and every time you have sex. The efficacy of latex condoms in preventing infection with HBV is unknown, but their proper use may reduce transmission;
- If you are pregnant, you should get a blood test for hepatitis B; infants born to HBV-infected mothers should be given HBIG (hepatitis B immune globulin) and vaccine within 12 hours after birth;
- Do not shoot drugs; if you shoot drugs, stop and get into a treatment program; if you can't stop, never share drugs, needles, syringes, water, or "works", and get vaccinated against hepatitis A and B;
- Do not share personal care items that might have blood on them (razors, toothbrushes);
- Consider the risks if you are thinking about getting a tattoo or body piercing. You might get infected if the tools have someone else's blood on them or if the artist or piercer does not follow good health practices;
- If you are a health care or public safety worker, get vaccinated against hepatitis B, and always follow routine barrier precautions and safely handle needles and other sharps.



If you have ever been exposed to HBV, even if you resolved the infection spontaneously or through treatment, you should not donate blood, organs, semen or other body tissues.

What can I do if I think I have been exposed to HBV but have not had the HBV vaccination?

There is an injectable substance called Hepatitis B Immune Globulin (HBIG) (see HAV and HBV Vaccine Fact Sheet Link.) Treatment with HBIG requires only one injection. It is like the vaccine only instead of getting it *before* you are exposed to HBV, you would get it *after* you have been exposed to HBV.

So, if you recently had sexual contact with someone who you find out was ill with HBV at the time you had sex, you could consult a nurse or a doctor and explain to them your specific situation. At that time they would decide whether or not you should receive the HBIG.



If more than two weeks have passed since the time you think you might have been exposed to the hepatitis B virus, HBIG will very likely not work. At that point it is best to continue to be on the alert for signs and symptoms which may or may not develop.

What does someone who is pregnant need to know about HBV?

ALL pregnant women should be tested for hepatitis B! Testing is especially important for women who fall into high-risk groups such as health care workers, women from ethnic communities where hepatitis B is common, spouses or partners living with an infected person, etc. If you are pregnant, be sure your doctor tests you for hepatitis B before your baby is born.

HBV testing is important because if you test positive for hepatitis B and are pregnant, the virus can be passed on to your newborn baby during delivery. If your doctor is aware that you have hepatitis B, he or she can make arrangements to have the proper medications in the delivery room to prevent your baby from being infected. If the proper procedures are

not followed, your baby has a **90% chance of developing** chronic hepatitis B if he or she does in fact become infected during delivery.

If you test positive for hepatitis B, then your newborn must be given the following two shots within twelve hours after delivery to ensure that a newborn has more than a **90% chance of being protected** against a lifelong hepatitis B infection:

- first dose of the **hepatitis B vaccine**
- single, one-time dose of the **Hepatitis B Immune Globulin (HBIG)**

You must also make sure that your baby receives the second and third dose of the hepatitis B vaccine at one and six months of age to ensure complete protection. There is no second chance to protect your newborn baby.

If you are infected with hepatitis B during pregnancy, the infection should not cause any problems for you or your unborn baby. Again, it is important for your doctor to be aware of your hepatitis B infection so that he or she can monitor your health and so your baby can be protected from an infection right after it is born.

The Centers for Disease Control and Prevention (CDC) recommends that all women with hepatitis B should be encouraged to breastfeed their newborns. The benefits of breastfeeding outweigh the potential risk of infection, which is minimal, especially since all infants should be vaccinated against hepatitis B at birth.



90 % of those who are HBV-infected during delivery will become chronic HBV carriers without post-exposure prophylaxis.